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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
06/838,452	04/07/1997	WARREN M. FARNWORTH	91-62.17	8883

7590 09/29/2003
STEPHEN A GRATTON
2764 SOUTH BAUN WAY
LAKEWOOD, CO 80228

EXAMINER

KARLSEN, ERNEST F

ART UNIT PAPER NUMBER

2829

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/838,452

Applicant(s)

FARNWORTH ET AL.

Examiner

Ernest F. Karlsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 78-83 and 87-98 is/are pending in the application.
- 4a) Of the above claim(s) 83, 89, 94 and 95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 78-82, 87, 88, 90-93 and 96-98 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claims 83, 89, 94 and 95 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions and/or species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 22

Claims 78-82, 87, 88, 90-93 and 96-98 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The use of the word "height" in the claims is not clear. Applicants' remarks in the amendment filed June 16, 2003 seem to be attempting to give the word "height" some special meaning and the Examiner is not sure what it is.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 78-82, 87, 88, 90-93 and 96-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano in view of Blonder et al and Agahdel et al. Nakano discloses apparatus for testing a semiconductor die including a plate 40 and a substrate 10 on the plate 40 as shown in Figure 4 of Nakano. The apparatus of Nakano would inherently have to have a clamping mechanism to hold a die against the probes on the substrate 10 because pressure has to be applied in order to make proper contact. The apparatus of Nakano is intended to have a die placed on the substrate 10. The die

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would inherently have to be held between the mechanism and the substrate in Nakano. Each contact of Nakano includes a bump 21 (Figures 2a and 2b) having a "height" and a single raised portion 22. The raised portion is intended to penetrate a pad on the die to a depth less than the thickness of the pad on the die being tested. (See Figure 2b.)

Nakano does not show plural raised portions as claimed and no clamping mechanism is clearly shown. Blonder et al shows plural raised portions on a contact meant to join a chip to a chip or a chip to a carrier. As stated in the abstract of Blonder et al, the raised portions can be on the chip or on the carrier. Blonder et al discloses cold welding but also intends that the parts may be separated by tugging at them. See column 5 lines 1-20 of Blonder et al. It is noted that Applicants' apparatus will inherently cold weld.

Blonder et al uses plural raised portions to improve contact and to penetrate a pad being contacted to a depth less than the depth of the pad being contacted. At least for the time that the parts of Blonder et al are being pressed together a clamping mechanism will be employed with the apparatus of Blonder et al. Agahdel et al clearly shows a clamping mechanism in Figures 1, 6 and 10-14. In addition Agahdel et al show plural raised portions extending from the bump 40. The raised portions are not designated by a number in Agahdel et al. Looking at Figure 5 of Agahdel et al, element 40 is a contact pad (bump) and a plurality of raised portions are formed by elements 44 and the materials in which they are embedded. Elements 44 are hard conductive particles. Elements 44 are embedded in a hard metal 46 such as nickel or tungsten and a nonoxidizing metal 48 such as gold is layered over the hard metal 46. Note that there are errors in the description and no number 48 in the drawings but the Examiner

considers that one skilled in the art could figure the structure out with a bit of pondering. It would have been obvious to one of ordinary skill in the art at the time of the invention to have adapted the plural raised feature of either Blonder et al or Agahdel et al and the clamping feature of Agahdel et al to the apparatus of Nakano because one skilled in the art would realize that so doing would result in better contact being made. The limitation to pointed raised portions of claims 87, 92 and 97 is disclosed by Nakano and Blonder et al. See column 8, lines 1-7 of Blonder et al. What constitutes a point is dependent on size and the raised portions of Agahdel et al are considered points. The limitations of claims 79 and 80 are inherent in any of the applied references. The substrate of Nakano is silicon and the bump includes metal as required by claims 81, 88 and 98. The pads disclosed in Nakano are bondpads as claimed in claims 82 and 91. The limitations of claims 90 and 93 are shown by any of Nakano Blonder et al and Agahdel et al. Note the level parts of the bump of Agahdel et al. Note that the points of claim 96 are disclosed by Nakano and Blonder et al. See column 8 of Blonder et al. The raised portions of Agahdel et al are considered points.

Any inquiry concerning this communication should be directed to Ernest F. Karlsen at telephone number 703-305-4768.

Ernest F. Karlsen

September 23, 2003


ERNEST KARLSEN
PRIMARY EXAMINER